TRC

Customer-Focused Solutions

EPA CONTRACT NO. 68-W6-0042
EPA WORK ASSIGNMENT NO. 052-RICO-01N9

EPA Project Officer: Diana King
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# DRAFT

## REMEDIAL INVESTIGATION REPORT

# Volume I – Sections 1.0 through 6.0

Pownal Tannery Superfund Site
Pownal, Vermont

JANUARY 2001

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# 1.0 Introduction

Metcalf & Eddy of Wakefield, Massachusetts (M&E) received Work Assignment (WA) No. 045-RICO-01N9 under the EPA Response Action Contract No. 68-W6-0042 (RAC) to complete a Remedial Investigation/Feasibility Study (RI/FS) at the Pownal Tannery Superfund (Site) in North Pownal, Vermont. M&E assigned the primary responsibility for completing most of the Remedial Investigation to TRC Environmental Corporation of Lowell, Massachusetts (TRC). M&E was responsible for overall project management and completion of the Human Health Risk Assessment, subcontractor procurement, and some field staffing. TRC was responsible for planning and execution of the field program, all data analysis, evaluation and interpretation, the ecological risk assessment, and preparation of this Remedial Investigation Report.

This report presents all of the data collected during the Pownal Tannery Remedial Investigation. This report also presents a scientific interpretation of the facts to provide a basis for further work, including a Feasibility Study to evaluate potential remedial alternatives. All work, unless otherwise specified, was conducted in accordance with the EPA approved Site Management Plan, dated March 2000 and the Field Sampling Plan Addenda, dated August 2000 and November 2000.

## 1.1 Purpose of Report

The following objectives for the Remedial Investigation Report evaluation are excerpted from the EPA approved, M&E/TRC Work Plan for this project. The location where each objective is addressed, either in this report or elsewhere, is noted in italics.

- Detailed presentation of all Field Investigation Methods (drilling techniques, geophysical surveys, sampling and analysis plans) *Section 2*
- Description of Site Physical Characteristics (surface features, geology, soils and vadose zone, surface-water hydrology, hydrogeology, meteorology, human populations and land uses, and ecological investigations) *Section 3*
- Description of Existing and Potential Sources of Contamination *Section 6*
- Evaluation of Nature and Extent of Contamination in all pertinent media (soil, ground water in overburden and bedrock, surface water, and air) *Section 4*
- Description of additional Site Characterization Studies *Section 2*
- Presentation and Evaluation of Laboratory Analyses and Data Validation Protocol *Section 4*
- Data Analysis Site Characteristics (physical site characteristics, source area characteristics, nature and extent, and contaminant fate and transport) *Sections 3, 4 and 5*
- Detailed Description and Presentation of the Ground Water and Surface Water Models *Section 5*
- Data Analysis Human Health Risk Assessment *to be provided in separate report*
- Data Analysis Ecological Risk Assessment *provided in Appendix DD*

- Overview of Data Management Procedures *Section 2*
- Overview of Community Relations Activities conducted during the project *Section 2*
- Reporting and Communications during project work *Section 2*

## 1.2 Background

The primary focus of this Investigation was to investigate contaminant releases associated with the former Pownal Tannery, now defunct, which operated in the village of North Pownal along the Hoosic River for much of the twentieth century. Based on the operating practices of the tannery and the propensity for such sites to be the source of uncontrolled contaminant releases to the environment, the Vermont Agency of Natural Resources, Department of Environmental Conservation conducted site inspections and audits while the facility was operational, then commissioned environmental studies of the property after the tannery operations ceased. Based on these inspections, audits and studies, plus subsequent studies conducted by the United States Environmental Protection Agency (EPA) the State and the Federal Government determined that contaminant releases had occurred and that the site warranted inclusion on the National Priorities List.

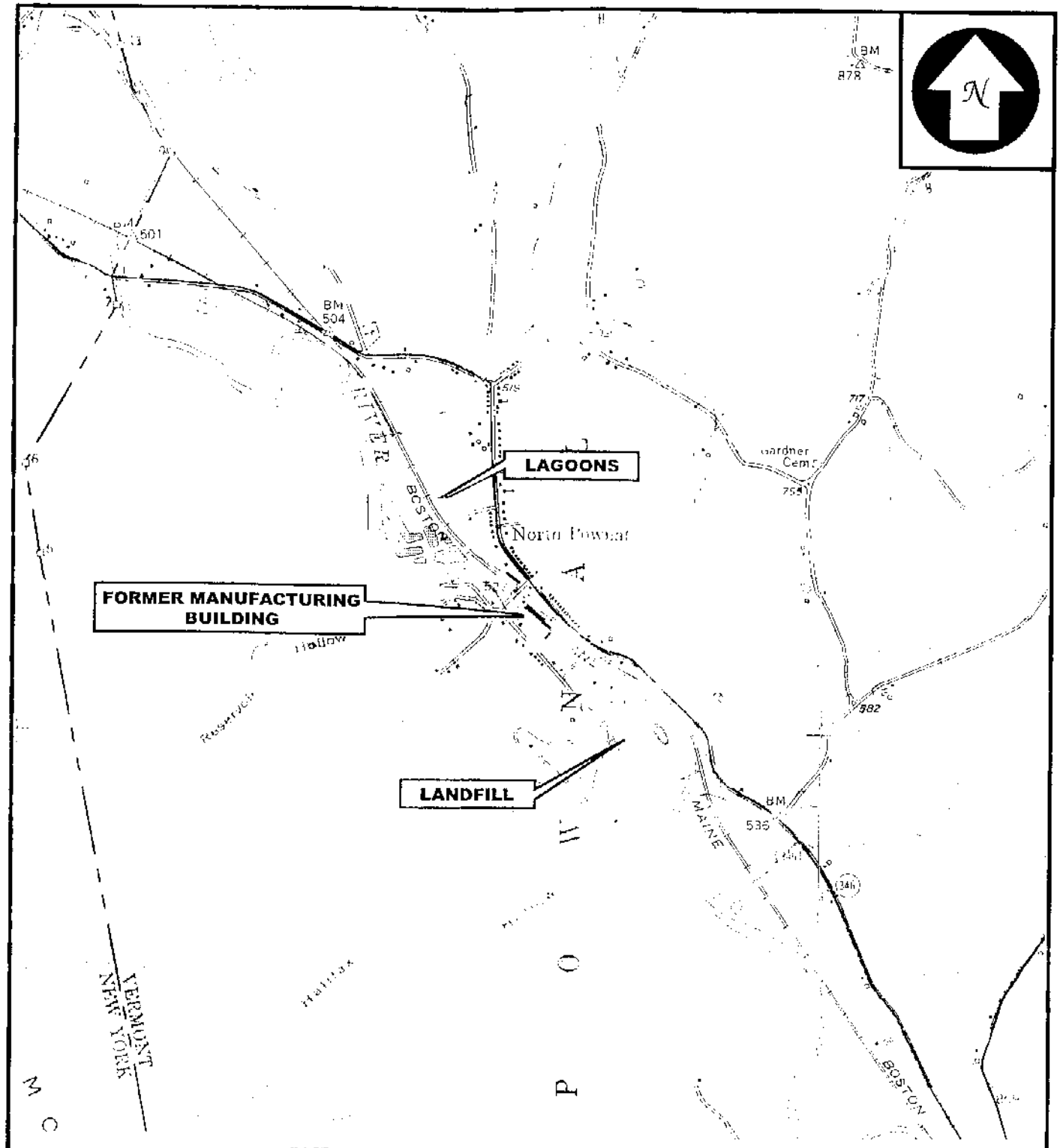
The study area for this Remedial Investigation encompasses all of the properties that are known or suspected to have been associated with contaminant releases from industrial activities at the former Pownal Tannery. The area includes both developed and undeveloped land, forests, wetlands, structures and historic sites, and the area is surrounded by residential, small business and agricultural properties. Additional details regarding the site, including previous environmental work and historic chronologies are discussed in the following sections.

### *1.2.1 Site Description*

Figure 1.2-1 shows the location of the Pownal Tannery site in the Village of North Pownal, Vermont, approximately 20 miles southwest of the City of Bennington, Vermont at 42° 47' 49.8" north latitude and 73° 15' 56.7" west longitude.

Figure 1.2-2 presents a map showing the site boundary and the areas of concern. The Site consists of four properties, all of which are owned by John Flynn and Sons. The larger, northern property is elongate and occupies approximately 30 acres. This larger parcel encompasses the Former Tannery Building Area and the Lagoon Area. This property extends south of the hydroelectric dam several hundred feet, is bordered to the east by the Boston and Maine railroad tracks, and is bounded to the west by the Hoosic River. The property extends north a short distance beyond the lagoons and is bordered to the north and east by farmland.

The Lagoon Area consists of four open depressions, remnants of the five tannery lagoons. The area is undeveloped and overgrown with vegetation. Portions of the lagoons have ponded water. A gravel road leads into the site with three locked gates and fences around some of the lagoons. The berms around each lagoon serve as trails or roads allowing access around most of the lagoons. One of the lagoons is filled in and covered with gravel, forming a broad unpaved flat area in the central portion of the lagoons.




BASE MAP IS A PORTION OF THE FOLLOWING 7.5' USGS QUADRANGLES:
NORTH POWNAL, VT-NY, 1954, PHOTOREVISED 1980; POWNAL, VERMONT 1954,

**Figure 1.2-1**

**SITE LOCATION MAP**

REMEDIAL INVESTIGATION/FEASIBILITY STUDY
POWNAL TANNERY
POWNAL, VERMONT

Metcalf & Eddy

TRC

Boott Mills South
Foot of John Street
Lowell, MA 01851
(978)970-5600

QUADRANGLE LOCATION

VT

TRC PROJ. NO.: 02136-0220-01N91

EPA CONTRACT NO.: 68-W6-0042

RAC SUBCONTRACTOR NO.: 107061

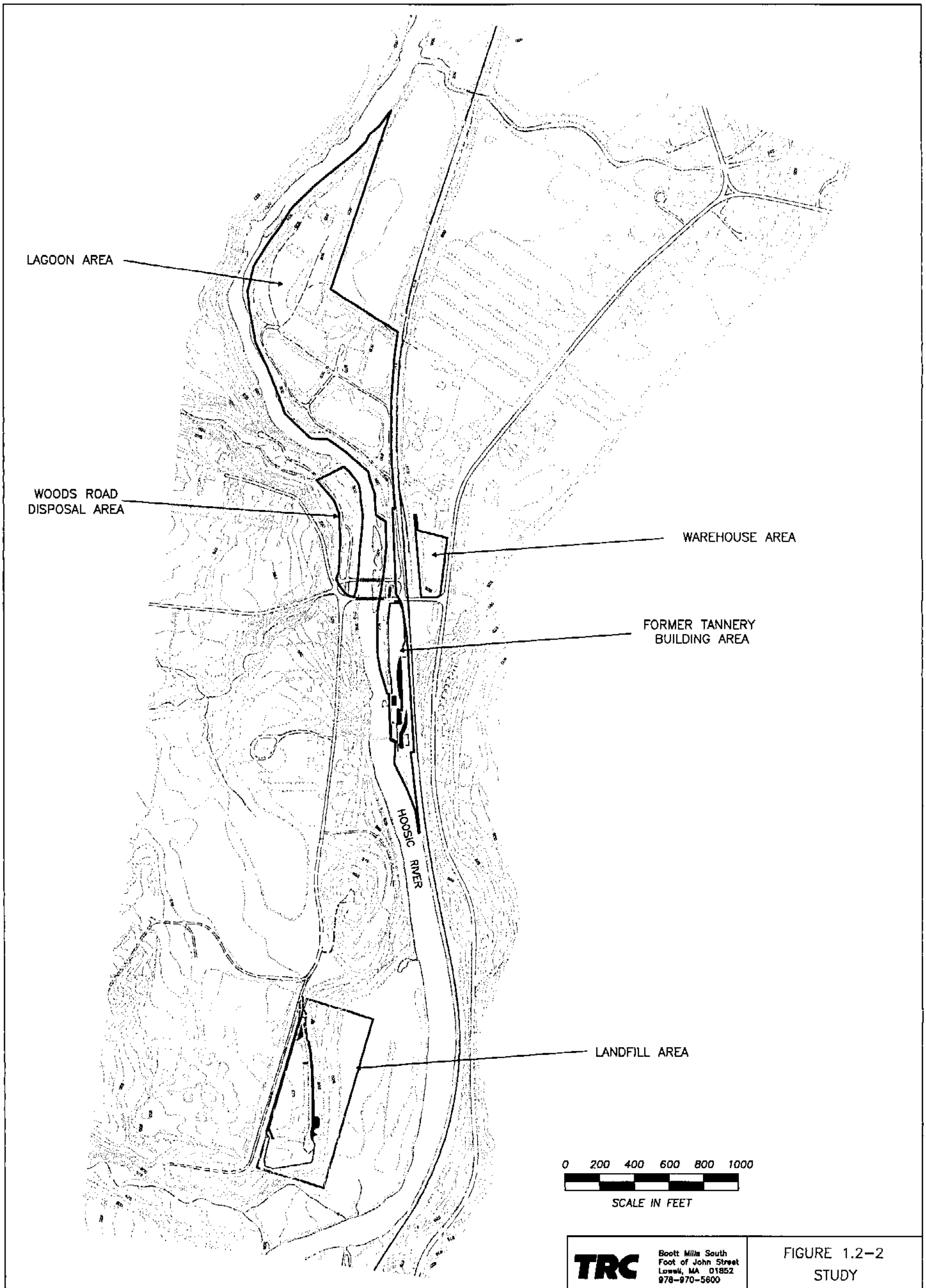



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FIGURE 1.2-2
STUDY
AREA
POWNAL TANNERY
POWNAL, VERMONT

M&E Metcalf & Eddy

The Former Tannery Building Area is a park, covered with grass, pavement and crushed stone. The area slopes down to the river and contains guard railings and remnants of the former tannery building foundation. A small building exists adjacent to the river to shelter the former hydroelectric works that is no longer operational.

Two smaller properties are located to the east and west of the larger property separated, respectively, by the Hoosic River and the railroad tracks. The small western property containing the Woods Road Disposal Area is located on the west bank of the Hoosic River bordered to the west by Woods Road. A pump house and two original Tannery water supply wells are located here, but neither is functional. This property slopes gradually to the river and is overgrown with a layer of riprap placed along the river edge.

The other small property containing the Warehouse Area is located east of the railroad tracks and is bounded to the west by State Route 346. Reportedly, hides were stored in this warehouse and on tables outside of the warehouse. A portion of this property is paved and is used for parking and for truck loading and unloading at the warehouse.

The fourth and southernmost property contains the landfill that was used by the tannery to receive sludge from the clarifier and lagoons. This southern property is rectangular and includes some wetlands and a portion of a pond located downhill (east) of the landfill. The pond and wetland extend further east to the Hoosic River. Residential properties border the landfill property to the north and south, and Dean Road forms the western property boundary. A gravel pit is located across Dean Road to the west.

### *1.2.2 Demography*

North Pownal is part of the town of Pownal, Vermont, incorporated in 1767. The current population of North Pownal is approximately 3,530.

### *1.2.3 Land Use*

All of the properties are situated within two town zoning districts: the "Village Residential" district and the "Rural Residential" district. The purpose of both the Village Residential and Rural Residential districts is to preserve the natural rural and scenic qualities of the Town, allowing residential and agricultural uses of property as well as some non-residential uses. Non-residential uses are permitted as long as they do not create certain nuisance conditions (noise, dust, vibration, glare, heat, odor or smoke). Allowable uses include, but are not limited to multiple family dwellings, recreation, construction or contracting businesses, manufacturing, research, auto repair, animal boarding, and any no-residential or non-agricultural use is subject to the conditions that are specified in the Town Zoning Bylaws (April 1, 1991, amended February 23, 1995).

There are several residences that border the property occupied by the Pownal Tannery and there are a few commercial businesses that abut the property. The nearest residence is approximately 75 feet from the Site and a retail store is located approximately 40 feet from the Site boundary. Within a mile radius from the Site, approximately 275 people are served by private drinking

water wells completed in either the overburden or bedrock.

Currently, the on-site warehouse is operated privately and used to store wood chips for a local business. The park located on the site of the former Tannery building is open for use by the community. Access to the lagoons on the site is posted, prohibited, gated and fenced. There is a locked gated fence surrounding the landfill on the southern property, but there is no site control for the property area outside of the landfill.

A portion of the site is listed on the Vermont Register of Historic Places (SR No. 0208-8), as is the adjacent General Store and the steel truss bridge that spans the Hoosic River (now closed). The area encompassing the former tannery building, the General Store (located adjacent to the tannery property) and 16 off-site residences (located on the eastern side of State Route 346) is designated as the North Pownal Mill Historic District.

### *1.2.4 Operational History*

The Pownal Tannery site has an industrial history that extends began over 200 years ago. A summary of key, relevant operational history is presented below.

- 1780: A grist mill is constructed by Richard Brown at the site.
- 1813: Richard Brown's son, Ethan Brown converted the grist mill into a wool weaving and carding plant.
- 1840: The wool weaving and carding plant is destroyed by fire.
- 1849: A woolen mill is constructed.
- 1856: The Troy and Greenfield Railroad is constructed along the Hoosic River and the site. Note that the original railroad bed crossed the Hoosic River near the Lagoon Area and originally ran on the western side of the Hoosic River through the Woods Road Disposal Area and east of the Landfill Area.
- 1863: The woolen mill is destroyed by fire.
- 1866: The Plunket and Barber Company constructed a multistory, brick, cotton textile mill on the site.
- 1876: The mill is purchased and operated by A.C. Houghton Company.
- 1915: A train freight station (located on the western bank of the Hoosic River) is demolished by a train wreck.
- 1920 (approximate): A second set of railroad tracks is constructed along the eastern side of the Hoosic River and the tracks on the western side are abandoned.

- 1931: The cotton mill ceases operation.

- 1936: The mill is refurbished by the Pownal Tanning Company and opens as a cow and sheep hide tanning operation. The operation consists of hide cleaning (beaming) using a variety of chemicals (pesticides, solvents), hydrochemical stabilization of the purified leather (tanning) using trivalent chromium, dyeing and lubrication of the tanned leather, followed by pasting and finishing of the leather into a variety of textures and thicknesses for commercial sale.

- 1939: A steel truss bridge is erected across the Hoosic River north of the former tannery building.

- 1940: The mill building is expanded.

- 1955: A hydroelectric dam is constructed across the Hoosic River to power the adjacent former tannery building and associated hydroelectric machinery is installed at the site.

- 1962: A lagoon system (two unlined lagoons) and a screen house are constructed to precipitate solids out of the waste water prior to discharge to the Hoosic River. One of the byproducts of the hydrochemical stabilization was a stream of waste water containing high concentrations of metals that was pumped several hundred feet to the north into these lagoons constructed next to the Hoosic River. Waste water was collected in the lagoons and screened to collect solids, then the water was pumped into the Hoosic River.

- 1965: Further expansion of the mill building occurs.

- 1971: Three lagoons added to system. The five lagoons occupy 22 acres.

- 1978: A clarifier building is constructed to clarify and flocculate sludge. An estimated 250,000 to 300,000 gallons per day of wastewater are discharged to the lagoons and solids from the clarifier were disposed of in Lagoons 1 and 2.

- 1980: Lagoons 1, 3A, 3B, and a portion of Lagoon 4 are filled with settled sludge.

- 1983: Lagoon 1 is covered with a 1 foot layer of silt.

- 1988: The tannery closes and files for Chapter 11 bankruptcy.

### *1.2.5 Regulatory History*

The earliest regulatory history related to the site concerned site operations and complaints from residents about odors and other issues. Later milestones are associated with federal involvement and eventual listing as a Superfund Site. A summary is provided below.

- 12/30/81: Pownal Tannery applied for permit to construct and operate a lined landfill to hold dewatered sludge.

- 1/21/82: The Vermont Agency of Natural Resources determined that the sludge in the lagoons should not be regulated as hazardous waste.

- 6/9/82: A disposal Facility Certification was issued to permit construction and operation of a lined landfill to receive sludge from lagoons. The landfill is to be comprised of three lined cells into which sludge is deposited, via truck, from the tannery lagoons approximately twice a week. A leachate tank is also installed to collect leachate from the landfill, and as the tank fills, the leachate is removed and disposed at a nearby waste water treatment works (Surwillo, 1991). The landfill is to be operated under a specific set of conditions, including daily cover with six inches of soil, drainage of the leachate tank and disposal into the Pownal Tanning Company wastewater treatment plant, semi-annual sampling of six ground water monitoring wells, two locations in Halifax Brook, and at six nearby residential drinking water wells,

- 1985: The Vermont Agency of Natural Resources issued a letter to the Pownal Tannery alleging deficiencies and maintenance problems at the site.

- 1987: Two-thirds of Landfill is closed and covered by the Pownal Tanning Company.

- 4/6/88: Vermont Agency of Environmental Conservation issued Administrative Order to Pownal Tannery. The order requires Pownal Tannery to take additional precautions to control odors, accelerate excavation of sludge from Lagoon No. 2, present a cleanup plan for Lagoons 4 and 5, testing of ground water monitoring wells and completion of a risk assessment

- 1995: The Hazard Ranking System Package is completed by TRC for EPA.

- 9/29/98: The Site is proposed for the National Priorities List (NPL) on September 29, 1998.

- 1/11/99: The Site is added to National Priorities List.

- 8/99: The Town of Pownal is awarded a Superfund Redevelopment Initiative Grant from EPA to study re-use options for the site after remediation is completed.

- 2/01: The Town completed their re-use study. After a thorough review of citizen and Town needs and developed a re-use plan for the Former Tannery Building Area, the Warehouse Area and the Lagoon Area. The re-use plan includes construction of a sewage treatment plant, a skating rink, recreational open areas and nature trails through the Lagoon Area.

### *1.2.6 Previous Investigations*

Numerous environmental investigations and interim remedial actions have been conducted at the Site since the 1960's. A summary of the work conducted and findings (where available) from previous investigations is presented below. Note that many of the previous testing programs included samples collected from locations that were not well documented and most of the previous data were not validated. Therefore, the data from previous investigations were used where possible to plan the sampling approach for the Remedial Investigation, and previous data were used in interpreting geological and hydrogeological site conditions, but the previous data were not used to support the risk assessments.

- 1980-1988: A limited ground water monitoring well network (16 wells) was installed around the lagoons and landfill, and samples were periodically collected and analyzed by the Pownal Tannery. During this period miscellaneous sampling and analysis of residential wells was performed, lagoon sludge testing was conducted (EP Toxicity) and a preliminary magnetometer survey was completed.

- 8/20/86: VTDEC issues order for the Pownal Tannery to conduct a limited hydrogeological assessment. Also during this period miscellaneous sampling and analysis of residential wells and lagoon sludge was conducted (including EP Toxicity testing), and a preliminary magnetometer survey was conducted and documented in a subsurface hazardous waste investigation report prepared by the tannery.

- 11/18/88: Four residential wells (Lubeck, Casey, Powell, and Tudor residences) and two lagoon area wells (L-7 and L-8) are sampled by Aquatec, Incorporated for dioxin and VOCs. No dioxins are detected, and two VOCs (chloroform, chlorobenzene) are detected in the Casey, Tudor and Powell wells at low concentrations (< 2 ppb) (Aquatec, 1988).

- 1/11/93: TRC completes a Site Inspection Prioritization (SIP) at the Site for EPA. Compressed gas cylinders, drums of chemical wastes, tanks and vessels of process wastes, friable asbestos, and sludges in the facility wastewater treatment system were found at the Site.

- 3/15/93: An Action Memorandum was signed to initiate a Time Critical Removal Action (TCRA), which commenced on April 12, 1993. The TCRA consisted of removal of hazardous substances from the site including compressed gas cylinders, asbestos containing materials, tank contents, three 1-gallon cans of tetrahydrofuran, suspected dioxin-containing wastes, and one drum containing pentachlorophenol. In addition, all tanks were cleaned and wastes sent off-site, covers were welded onto five open topped in-ground tanks located in the lagoon area, sludge in floor drains and smoke stack debris were sampled, all buildings were sealed to prevent public access and potential exposure, waste piles were sampled and all hazardous contents were disposed off-site and a breach in Lagoon 4 was repaired. On-site activities were completed on May 18, 1994.

- 5/93 and 9/93: Ground water testing in the Lagoon Area indicates low concentrations (<30 ppb) of Chromium and low concentrations of VOCs, including acetone (410 ppb),

chlorobenzene (<22 ppb) and 1,2-dichlorobenzene (<10 ppb).

- 10/95: Laboratory testing of soil samples from borings advanced to examine subsurface conditions for placement of a temporary bridge across the Hoosic River indicate elevated levels of polyaromatic hydrocarbon (total maximum concentration of all polyaromatic hydrocarbons = 57,400 ppb) and methyl naphthalenes (total maximum concentration 6,600 ppb).

- 2/97: Metcalf & Eddy submitted a report on an Ecological Investigation that included the review of off-site mapping to identify the presence of wetlands, flood plains and other natural features of the Site, as well as an on-site ecological survey, which provided a limited assessment of the plant and animal species inhabiting the Site. Also, during the summer of 1995, M&E conducted a limited investigation of the clarifier building, landfill, and lagoons, collecting soil, river sediments, leachate, ground water and surface water samples (i.e., in the Hoosic River and lagoons).

- 3/97: Roy F. Weston conducted an additional investigation for EPA to further characterize the tannery building and screen house building. This investigation included sampling and analysis of wood, concrete, soil sludge, debris, and standing water within the buildings.

- 3/97: Metcalf & Eddy conducted a Superfund Accelerated Cleanup Model (SACM) field investigation at the Site for EPA. This investigation included sampling and analysis of wood, concrete, soil sludge, debris, and standing water within the buildings.

- 7/97: Weston conducted an investigation for EPA to further characterize the nature and extent of contamination within the tannery buildings.

- 6/98: The Agency for Toxic Substances and Disease Registry conducted a Health Consultation for EPA.

- 11/98: EPA completes Engineering Evaluation/Cost Analysis (EE/CA) to assess various options for controlling and containing the source of contamination at the Site.

- 11/98: Engineering Evaluation Cost Analysis (EE/CA) is completed for the site.

- 3/22/99: Action Memorandum for a Non Time Critical Removal Action is signed. The Scope of Work includes decontamination and partial demolition of the former tannery buildings, excavation of soils and sludges above specified cleanup levels within the tannery building footprint, and construction of a RCRA Subtitle C cover of the on-site landfill. This work is currently underway and will be completed in 2001.

- 6/00: The Agency for Toxic Substances and Disease Registry conducted a Health Consultation for EPA.

- 1/01: Remedial Investigation of the site begins.

### *1.2.7 Status of Remedial Actions*

In early 1999, EPA began a Non Time Critical Removal Action at the site. Although not yet completed (completion is anticipated in 2001), several remedial activities took place on the site during 1999 and 2000. A summary of these activities is presented below.

***Landfill Area:*** The landfill was regraded and covered with a multi-layer, RCRA Subtitle C cap.

***Former Tannery Building:*** The tannery building was decontaminated and demolished and an underground storage tank was removed. Underground manways and piping was abandoned or removed. Soil from within the building footprint was excavated and disposed in the landfill prior to closure.

***Warehouse Area:*** An underground storage tank located south of the warehouse was removed. Floor drains and scale pits inside the building were cleaned of sludge, and the sludge was disposed off-site. Several overpacked drums stored in the warehouse were removed and disposed off-site.

***Woods Road Disposal Area:*** Approximately 2,500 cubic yards of contaminated fill containing soil, building demolition debris, leather scraps, piping, wire, and other debris was excavated and disposed off-site. The area was regraded and the slope along the river edge was reinforced with rock.

***Lagoon Area:*** The clarifier and press buildings were demolished and removed along with some underground piping.

## 1.3 Organization of Report

The organization of this report essentially follows the outlined that is suggested in the United States Environmental protection Agency's "Guidance or Conducting Remedial Investigation and Feasibility Studies under CERCLA (EPA, 1988). The first two sections present background information about the study area and describe the investigations that were conducted. Section 3.0 presents the physical characteristics of the study area. Section 4.0 discusses the nature and extent of contamination of the site and study area. Section 5.0 presents a discussion of the fate and transport of site contamination, including potential migration pathways. Section 6.0 presents a site conceptual model for contamination.

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